Rec. zool. Surv. India: Vol. 122(1)/97–100, 2022
DOI: 10.26515/rzsi/v122/i1/2022/154669

ISSN (Online) : 2581-8686
ISSN (Print) : 0375-1511

Short Communication

First confirmed report of Assam Leaf Turtle, *Cyclemys gemeli* Fritz *et al.*, 2008 (Testudines: Testudinoida: Geoemydidae) from Arunachal Pradesh, India

Bikramjit Sinha[1*] and Kirty Prosad Nath[2]

[1]*Zoological Survey of India, North Eastern Regional Centre, Risa Colony, Shillong – 793001, Meghalaya, India; Email: bj.sinha@gov.in*

[2]*Zoological Survey of India, Arunachal Pradesh Regional Centre, Senki Valley, Itanagar – 791113, Arunachal Pradesh, India*

Abstract

The distribution of the Assam leaf turtle, *Cyclemys gemeli* in Arunachal Pradesh was not certain for lack of any tangible report. The occurrence of the species in this Himalayan state based on incidental collection of two individuals, one juvenile and one adult from a swampy area from the backyard of Zoological Survey of India campus at Itanagar in the Itanagar Wildlife Sanctuary, Papumpare district, Arunachal Pradesh is reported herein. Brief diagnostic characters are also provided based on the observed individuals.

Keywords: Arunachal Pradesh, *Cyclemys gemeli*, Eastern Himalaya, New Record, Papumpare

Introduction

The Testudine Geomydid genus *Cyclemys* Bell, 1834, commonly known as Leaf Turtles is characterised by a secondary division of the abdominal scutes because of the ontogenetic development of a pastoral hinge (Fritz *et al.*, 1997). These small to medium-sized semiaquatic turtles are distributed over South and Southeast Asia (Fritz *et al.*, 2008). Seven valid species of this genus are known under two morphologically distinct groups: a yellow-bellied species group with three taxa namely *Cyclemys atripons* Iverson and McCord, 1997; *C. dentata* Gray, 1831 and *C. pulchristriata* Fritz *et al.*, 1997 and a dark-bellied species group consisting of four species viz. *C. oldhamii* Gray, 1863; *C. enigmatica* Fritz *et al.*, 2008; *C. fusca* Fritz *et al.*, 2008 and *C. gemeli* Fritz *et al.*, 2008. Of the seven species, only *C. dentata* and *C. gemeli* are found in India. The former is known only from the northern India while the later is reported from North-eastern part of the country only (Uetz *et al.*, 2020).

Fritz *et al.* (2008) described the Assam leaf turtle, *C. gemeli* from the Jia Bharali River region, Nameri National Park, near Tezpur, Assam based on a bony shell recovered from the villagers bordering Arunachal Pradesh and photograph of a live female. In the same paper it is stated that some specimens of *Cyclemys* collected from Mahanada Sanctuary in Darjeeling, West Bengal and Bahraich, Uttar Pradesh near Nepal border looked like to be *C. gemeli*, but there is no confirmation of the occurrence of the species in these areas. Subsequently, Praschag *et al.* (2009) provided an extended description of external morphology and habitat of *C. gemeli* based on ten live individuals of different age groups (adults, sub-adults and juveniles) collected from Southeast Goalpara of Assam in addition to the type locality, Meghalaya and Nagaland; thus extending the distribution of the species only within the NE India. The *Cyclemys* population of Borail Wildlife Sanctuary in Southern Assam was assigned to *C. gemeli* (misspelled as *gameli*), a new locality record of the species (Das *et al.*, 2009). Later on, it has been recorded

* *Author for correspondence*

Article Received on: 02.09.2020 Accepted on: 30.12.2021

from other parts of Assam (Basumatary and Sharma, 2013; Purkayastha *et al.,* 2013); Bangladesh (Kabir *et al.*, 2009); Bhutan (Wangyal *et al.,* 2012). Recently, it has been confirmed from Darjeeling-Sikkim Himalaya, West Bengal (Pradhan *et al*., 2020; Thapa *et al*., 2021). Praschag *et al.* (2009) suggested that all *Cyclemys* records west of the Arakan Mountains and Naga hills represents *C. gemeli* and not the previous records as *C. oldhami*. However, there is no tangible record of occurrence of neither *C. oldhami* nor *C. gemeli* from Arunachal Pradesh though the later is reported to be found in the state (Ahmed *et al.*, 2009; TTWG, 2017). This is also apparent in the distribution account of the species referred by Thapa *et al*., (2021). Even the global reptile database (Uetz *et al*., 2020) does not reflect the distribution of *C. gemeli* in Arunachal Pradesh. We hereby confirm the occurrence of *C. gemeli* based on two female individuals whose morphological features and measurements are in conformity with that provided by Fritz *et al.* (2008) and Praschag *et al.* (2009).

Material and Methods

Two female individuals were opportunistically collected from an undisturbed urban forest patch of Senki Valley, Itanagar. Among the two individuals one was juvenile and another was adult. The identities of the specimens were confirmed with the help of Fritz *et al,* 2008; Praschag *et al.,* 2009. Morphological features of the specimens were observed and recorded and necessary measurements such as, Straight Carapace Length (SCL), Straight Carapace Width (SCW), Curved Carapace Length (CCL), Curved Carapace Width (CCW), Greatest Plastral Length (GPL) and Greatest Plastral Width (GPW) were recorded with a Digital Venire Calliper to the nearest 1 mm. After taking measurements and photographs, the specimens were handed over to the officials (Curator and Medical Officer) of Itanagar Biological Park for release in to the natural habitat.

Result and Discussion

The present report of *C. gemeli* is based on two female individuals (1 juvenile and 1 adult) collected incidentally by the authors from the backyard of Zoological Survey of India campus, Itanagar (27.1031 N, 93.6941 E, 215 m) on 9th August 2020 (Figures 1A-D). The morphometric measurements of the specimens were; Juevnile (SCL = 9.81 cm, SCW = 8.25cm, CCL = 10.95 cm, CCW = 10.31 cm, GPL = 8.75 cm and GPW = 5.92 cm) and adult (SCL = 21.15 cm, SCW=16.85 cm, CCL = 22.75 cm, CCW = 20.75 cm, GPL = 20.55 cm and GPW = 14.41 cm). Some distinguishing morphological features of *C. gemeli* were noted to be:

Morphological Features

Juvenile with flat, rounded, reddish brown coloured carapace; adult with elevated, elongated, smooth dark brown coloured carapace. Mid-dorsal keel prominent in the juvenile, somewhat inconspicuous in the adult. Shells in juvenile with dark radiation in scutes, relatively faded up in adult. Plastron flat (characteristics of female) and dark-coloured in both the individuals. The adult individual was characterised by a pastoral hinge that divides the abdominal scutes, resulting in small triangular extra scutes positioned between the pectoralia and abdominalia. Top of the head uniformly coloured, temporal region and neck was more or less uniformly dark brown in both individuals. Juvenile has longer tail than that of adult. Juvenile and adult with fully webbed digits.

Habitat Features

C. gemeli is a diurnal freshwater turtle and inhibits river bed, oxbow lake, fast flowing stream or creeks, leaf litters of sub-tropical evergreen or semi-evergreen forest, thickly vegetated forest floor. The leaf-like appearance of the turtle is presumably helpful in camouflaging within leaf litter. It is a bottom walker rather than swimmer and rests on land at night (Ahmed *et al.,* 2009). The individuals of the present study were collected from a swamp area with a very small nallah running through it and the overall vegetation was dominated by bamboo and ferns interspersed with shrubs like *Lantana camara*, *Mikania micrantha* and others (Figures 1E-F). It is an omnivorous turtle and feeds on invertebrate like grasshopper, snails, small fishes, amphibians and wild ripen fruits.

The type locality of *C. gemeli* in Nameri National Park (NNP), Assam is immediately followed by the Pakke Tiger Reserve (PTR), Arunachal Pradesh; demarcated for the sake by a mere fencing. Both the Protected Areas (PAs) share similar habitats, vegetation, topography to a great extent; most of the drainages of the southern part of PTR pass through NNP before final discharge in to the mighty Brahmaputra. So, there is maximum likelihood

that *C. gemeli* would occur in PTR, at least in the lower reaches on the Southern part of the reserve. However, as mentioned earlier, no authentic record of *C. gemeli* form the state could be traced out. Thus, the present record is the first confirmed report of *C. gemeli* from the Himalayan state of Arunachal Pradesh. On another note, Das and Das (2017) characterise *C. gemeli* to have 3 keel in the shell; which may be due to oversight as it is the specific character of the Keeled Box Turtle, *Cuora mouhotii* (Gray, 1862) (Smith, 1931; Ahmed *et al.*, 2009) whereas *C. gemeli* has only one mid-dorsal keel that is prominent in juveniles; in the adults it is apparent in the scutes but depressed in the inter-scute spaces which has been observed in the present individuals.

References

Ahmed, M.F., Das, A. and Dutta, S.K. 2009. Amphibians and Reptiles of Northeast India- A Photographic Guide: 1-168, Aaranyak, Guwahati, India.

Basumatary, R. and Sharma, D.K. 2013. The turtle fauna of Kaziranga National Park, Assam, India with notes on natural history and conservation status. *Herpetology Notes*, **6**:59-72

Choudhury, A. 2004. Kaziranga-Wildlife of Assam: 1-94, Rupa and Company, New Delhi.

Das, A., Saikia, U., Murthy, B. H. C. K., Dey, S. and Dutta, S.K. 2009. A herpetofaunal inventory of Barail Wildlife Sanctuary and adjacent regions, Assam, North-eastern India. *Hamadryad*, **34**(1):117-134

Das, I. and Das, A. 2017. A Naturalist's Guide to the Reptiles of India, Bangladesh, Bhutan, Nepal, Pakistan and Sri Lanka. 1-176, John Beaufoy Publishing Ltd., Oxford.

Fritz, U., Gaulke, M. and Lehr, E. 1997. Revision der südostasiatischen Dornschildkröten-Gattung *Cyclemys* Bell, 1834, mit Beschreibungeiner neuen Art. *Salamandra*, **33**:183-212.

Fritz, U., Guicking, D., Auer, M., Sommer, R. S., Wink, M. and Hundsdörfer, A. K. 2008. Diversity of the Southeast Asian leaf turtle genus *Cyclemys*: how many leaves on its tree of life? *Zoologica Scripta*, **37**(4):367-386. https://doi.org/10.1111/j.1463-6409.2008.00332.x

Kabir, S.M.H., Ahmed, M., Ahmed, A.T.A., Rahman, A.K.A., Ahmed, Z. U., Begum, Z. N. T., Hassan, M. A. and Khandker, M. (Eds). 2009. Encyclopedia of Flora and Fauna of Bangladesh. Vol-25. Amphibians and Reptiles. 1-204, Asiatic Society of Bangladesh, Dhaka.

Pradhan, A., Chettri, N. and Sengupta, S. 2020. First record of the Assam Leaf Turtle *Cyclemys gemeli* (Fritz *et al*., 2008) (Reptilia: Testudines: Geoemydidae) from the Darjeeling-Sikkim Himalaya, India. Journal of Threatened Taxa, **12**(13):16909-16911. https://doi.org/10.11609/jott.6633.12.13.16909-16911

Praschag, P., Hundsdörfer, A. K. and Fritz, U. 2009. Further specimens and phylogenetic position of the recently described leaf turtle species *Cyclemys gemeli* (Testudines: Geoemydidae). *Zootaxa*, **2008**:29-37.

Purkayastha, J., Ahmed, M.H., Islam, H., Das, J., Sarma, M., Basumatary, M., Sarma, N., Chatterjee, N., Singha, S., Nair, V., Purkayastha, A., Dutta, J. and Das, M. 2013. Turtles of the Temple Pond of Kamakhya, Assam, *India. Reptile Rap*, **15**:11-15.

Smith, M. A. 1931. *The fauna of British India including Ceylon and Burma*, Reptilia and Amphibia. Vol. 1. Loricata, Testudines. 1-185. Taylor and Francis, London. https://doi.org/10.2307/1436417

Thapa, A., Pradhan, P., Thakur, M., Joshi, B.D., Sharma, L.K. and Chandra, K. 2021. A new elevational and locality record of the Assam Leaf Turtle, *Cyclemys gemeli* (Geoemydidae), from the Darjeeling Hills in the Central Himalayan Biogeographic Province. Reptiles and Amphibians, **28**(2): 326–328.

TTWG [Rhodin, A.G.J., Iverson, J.B., Bour, R. Fritz, U., Georges, A., Shaffer, H.B., and van Dijk, P.P.]. 2017. Turtles of the World: Annotated Checklist and Atlas of Taxonomy, Synonymy, Distribution, and Conservation Status (8th Ed.). Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. *Chelonian Research Monographs*, **7**:1-292. https://doi.org/10.3854/crm.7.checklist.atlas.v8.2017

Uetz, P., Freed, P. and Hošek, J. (eds.). 2020. The Reptile Database. Reteived from: http://www.reptile-database.org

Wangyal, J. T., Wangchuk, D. and Das, I. 2012. First Report of Turtles from the Himalayan Kingdom of Bhutan. *Chelonian Conservation and Biology*, **11**(2):268-272. https://doi.org/10.2744/CCB-0995.1

Plate 1. *Cyclemys gemeli* from Itanagar, Papumpare district, Arunachal Pradesh: **1A**. Juvenile dorsal view, **1B.** Juvenile ventral view, **1C.** Adult dorsal view, **1D.** Adult ventral view, **1E & 1F.** micro and macro habitat of the individuals collected.